LOAD DEFORMABLE BICYCLE SEAT

Relation to Previously-Filed Provisional Patent Application

The present non-provisional, PCT application for patent entitled "Load Deformable Bicycle Seat" stems from, relates to, claims the benefit of, relies on the priority of, improves upon, and enhances the subject matter of the previously-filed provisional patent application number 60/349,018, filed January 17, 2002, under the title "'M' Shaped Bicycle Seat with Ergonomic Nose".

Field of the Invention

The invention relates, in general, to bicycle seat constructions and more specifically to a bicycle seat comprising a unique substantially flat posterior body section on which the rider sits, a unique load deformable elongated hollow nose section, and a unique transition at the join of the body section to the nose section of the seat.

Background of the Invention

So-called anatomically correct bicycle seat constructions having a somewhat flat seat for the buttocks area are found in United States Patents 5,988,739 and 6,019,423. United States Patents 6,106,059 and 6,244,655 illustrate seats that eliminate pressure in the perineal areas. Several United States Patents, notably patents D408,159; D25,153; D27,307; D27,730; D28,434; 5,988,739; 6,231,122 and 6,244,655 describe a somewhat flattened seat section, and United States Patents D428,271; D431,920; D27,307; and D28,434 illustrate various forms of abrupt transition from a body section to a nose section.

Despite what can be observed in the prior art patents cited above, little has changed in seat design since the late 1800s. Discomfort of bicycle seats, for example, causes people to discontinue cycling. Male impotence, the most publicized risk associated with bicycle seats, represents one of several clinical syndromes associated with current bicycle seat designs. Recent studies support the theory that a decrease in penile oxygen does occur when riding seated on a bicycle equipped with a seat of current design. Seat design is also known to affect how certain arteries are compressed. The teachings of United States Patent 6,106,059 will be found helpful in understanding how bicycle seat designs affect body functions.

Summary of the Invention

A bicycle seat according to the present invention, as expressed in general terms, includes a specific combination of elements comprising: 1) a hollow nose section constructed such that when loaded it can deform to a limited extent; 2) a substantially wide, substantially flat and substantially rigid superiorly facing posterior section forming a seat; and 3) an abrupt transition section between the posterior section and the nose section.

Expressed in terms more akin to a biomechanical viewpoint, the load deformable bicycle seat of the present invention provides:

1. A substantially flat posterior section providing a seat that slopes downwards anteriorly, and redistributes the contact pressure through the gluteal muscles and hamstrings and away from the perineum (the central, soft groin tissue).
2. An abrupt transition section between the nose section and posterior section of the bicycle seat designed to avoid arterial and nerve compression along the pelvic bony structure (namely the medial borders of the pubic rami).
3. A hollow, deformable nose section that places contact pressure along the center of the pelvis initially and is able to redistribute the pressure through the lateral perineal structures, in response to which such structures are able to best tolerate contact pressure as the load on the seat nose increases.

Brief Description of the Drawings

Figure 1 is a perspective view of a load deformable bicycle seat according to the invention.

Figure 2 is a top plan view of the bicycle seat of Figure 1.

Figure 3 is a bottom plan view of the bicycle seat of Figure 1.

Figure 4 is a side elevation view of the bicycle seat of Figure 1, the opposite side elevation view being a mirror image of that shown.

Figure 5 is a front elevation view of the bicycle seat of Figure 1.

Figure 6 is a rear elevation view of the bicycle seat of Figure 1.

Figure 7 is an enlarged cross-section view of the nose section taken in the direction of lines 7-7 of Figure 4 and with the nose section free of load.

Figure 8 is an enlarged cross-section view of the nose section taken in the direction of lines 7-7 of Figure 4 with the nose section under load.

Figure 9 is a longitudinal section view taken in the direction of lines 9-9 of Figure 2.

Figure 10 is a top plan view of the seat surface without the longitudinal rib section or pad end cover.

Description of the Invention

Referring initially to Figure 2 and the prior description, it will again be noted that the deformable bicycle seat 20 of the invention comprises three sections, namely a posterior section PS, a nose section NS, and an abrupt transition section TS.

Posterior section PS of seat 20 supports and is designed to promote pressure distribution around the ischeal tuberosities. The seat surface 22 is substantially flat or shaped slightly concave to avoid pushing into the perineal region of the groin. The width W (Figure 2) of seat 20 is preferably at least 115 mm from side to side.

Nose section NS comprises an integrated hollow tubular piece of non-deformable plastic, hard rubber, or the like having, as seen in cross section (Figure 9), a rounded and sealed anterior portion 21. Hollow tubular nose section NS extends outwardly from the posterior section PS as indicated in Figure 2. Nose section NS has a hole 39 formed therein to receive a rib 40 (Figure 10). The purpose of rib 40 is to provide deformable support and also limit the amount of inferior deformation within the medial portion of nose section NS of seat 20 and provide suspension to the center of nose section NS. This allows for the primary region of pressure through nose section NS to be located centrally. As the load and external pressure on rib 40 of nose section NS increases, the center portion (Figure 8) of rib 40 will deform inferiorly and thus spread the pressure towards the lateral aspects of the nose section NS. The deformation from the point at which the center portion (Figure 8) of rib 40 of nose section NS would become inferior to the lateral portions of the nose section NS by contacting the inferior interior portion 31 (Figure 8) of nose section NS and creating a mechanical stop (Figure 8) to further deformation. The inferior portion of nose section NS is made sufficiently thick in radius to allow the insertion of the anterior portion of seat rails 35, 37. The density and deformability of rib 40 of nose section NS could be varied in different seats to correspond to different rider weight limits.

The flat posterior of seat 20 will transition along a radius less than 5 inches to nose section NS of seat 20 and within an angle A of between 90 and 125 degrees (Figure 2). This abrupt transition functions to remove pressure from the medial border of the pubic rami during anteriorly rotated pelvic positions.

Rib 40 is made up of an upper half and a lower longitudinal rib located between non-deformable side walls 44, 46. Screws 50 join walls 44, 46 to a lower half 52. Rib 40 is formed

of a deformable molded material, which deforms when nose section NS is loaded as depicted in Figure 8. It should be emphasized that the deformable material can be made of different degrees of hardness. Thus, the weight of the user would determine what degree of hardness would be chosen.

Lower half 52 is formed of a relatively rigid material and provides a stop 54 to limit travel of rib 40. Rib 40 thus allows for the initial pressure on nose section NS to be on the center line perineal structures, and, as the load is increased, it permits the pressure to be dispersed to lateral aspects of the perineum.

It will be noted that the front ends of rails 35, 37 are anchored in the lower half 52 of nose section NS (Figure 4) whereas the rear ends of rails 35, 37 are anchored in locks 60 forming part of the posterior section PS (Figure 4). A suitable fabric cover FC encloses appropriately placed layers of resilient foam material FM as noted in the drawings (Figures 7 and 8). Cover FC is preferably formed from leather sections stitched together forming seams 38.